We claim:

1. A millimeter wave imaging system comprising:
   A) at least one millimeter wave frequency scanning antenna for collecting frequency dependent beams of millimeter wave radiation from a narrow one-dimensional field of view;
   B) a millimeter wave amplifier for amplifying at the collected frequencies said millimeter wave radiation;
   C) a beamformer for separating said amplified collected radiation to produce frequency dependent signals corresponding to said frequency dependent beams, said beamformer comprising:
      1) a plurality of delay lines,
      2) a millimeter wave lens, and
      3) a plurality of millimeter wave power detectors; and
   D) a sampling circuit for reading out frequency dependent signals to produce a one-dimensional image of the antenna field of view.
2. The imaging system as in Claim 1 and also comprising a focusing means for focusing said frequency-scanning antenna.
3. The imaging system as in Claim 2 wherein said focusing means comprises a cylindrical reflector and a cylindrical lens.
4. The imaging system as in Claim 1 wherein said millimeter wave amplifier comprises three MMIC amplifiers fabricated on an indium phosphate substrate and a band pass filter.
5. The imaging system as in Claim 4 wherein said amplifier comprises a co-planar waveguide design.
6. The imaging system as in Claim 4 wherein said amplifier provides gains of at least 50 dB.
7. The imaging system as in Claim 1 wherein said delay lines are comprised of etched copper to create circuit patterns of varying lengths.
8. The imaging system as in Claim 7 wherein said delay lines define copper surfaces having surface roughness less than 300 nanometers.

9. An imaging system as in Claim 1 wherein said at least one frequency scanning antenna is one frequency scanning antenna.

10. An imaging system as in Claim 1 wherein said one frequency scanning is at least 20 inches long.

11. An imaging system as in Claim 1 wherein said one frequency scanning antenna is about 26 inches long and comprises about 300 inclined slots functioning as receiving apertures.

12. An imaging system as in Claim 8 wherein said at least one frequency scanning antenna is one frequency scanning antenna.

13. An imaging system as in Claim 8 wherein said one frequency scanning is at least 20 inches long.

14. An imaging system as in Claim 8 wherein said one frequency scanning antenna is about 26 inches long and comprises about 300 inclined slots functioning as receiving apertures.

15. A single stick millimeter wave imaging system

A) a single millimeter wave frequency scanning antenna for collecting frequency dependent beams of millimeter wave radiation from a narrow one-dimensional field of view;

B) a millimeter wave amplifier for amplifying at the collected frequencies said millimeter wave radiation;

C) a beamformer for separating said amplified collected radiation to produce frequency dependent signals corresponding to said frequency dependent beams, said beamformer comprising:

1) a plurality of delay lines,

2) a millimeter wave lens, and

3) a plurality of millimeter wave power detectors; and

D) a sampling circuit for reading out frequency dependent signals to produce a one-dimensional image of the antenna field of view.

16. The imaging system as in Claim 15 and also comprising a focusing means for focusing said frequency-scanning antenna.

17. The imaging system as in Claim 15 wherein said focusing means comprises a cylindrical reflector and a cylindrical lens.

18. The imaging system as in Claim 15 wherein said millimeter wave amplifier comprises three MMIC amplifiers fabricated on an indium phosphate substrate and a band pass filter.

19. The imaging system as in Claim 15 wherein said amplifier comprises a co-planar waveguide design.

20. The imaging system as in Claim 15 wherein said amplifier provides gains of at least 50 dB.

21. The imaging system as in Claim 15 wherein said delay lines are comprised of etched copper to create circuit patterns of varying lengths.

22. The imaging system as in Claim 15 wherein said delay lines define copper surfaces having surface roughness less than 300 nanometers.

23. A portal contraband screener comprising a plurality of millimeter wave sensors, each of said plurality of millimeter wave sensors comprising:

A) at least one millimeter wave frequency scanning antenna for collecting frequency dependent beams of millimeter wave radiation from a narrow one-dimensional field of view;

B) a millimeter wave amplifier for amplifying at the collected frequencies said millimeter wave radiation;

C) a beamformer for separating said amplified collected radiation to produce frequency dependent signals corresponding to said frequency dependent beams, said beamformer comprising:

1) a plurality of delay lines,

2) a millimeter wave lens, and

3) a plurality of millimeter wave power detectors; and

D) a sampling circuit for reading out frequency dependent signals to produce a one-dimensional image of the antenna field of view.

24. The screener as in Claim 23 wherein each of said plurality of millimeter wave sensors also comprises a focusing means for focusing said frequency-scanning antenna.

25. The screener as in Claim 24 wherein said focusing means comprises a cylindrical reflector and a cylindrical lens.

26. The screener as in Claim 25 wherein each of said millimeter wave amplifiers comprises three MMIC amplifiers fabricated on an indium phosphate substrate and a band pass filter.

27. The screener as in Claim 26 wherein said amplifier comprises a co-planar waveguide design.

28. The screener as in Claim 26 wherein said amplifier provides gains of at least 50 dB.

29. The screener as in Claim 23 wherein each of said delay lines are comprised of etched copper to create circuit patterns of varying lengths.

30. The screener as in Claim 29 wherein said delay lines define copper surfaces having surface roughness less than 300 nanometers.

31. A portal contraband screener comprising a plurality of millimeter wave sensors, each of said plurality of millimeter wave sensors comprising:

A) at least one millimeter wave frequency scanning antenna for collecting frequency dependent beams of millimeter wave radiation from a narrow one-dimensional field of view;

B) a fast switch for calibration;

C) a millimeter wave amplifier for amplifying at the collected frequencies said millimeter wave radiation, said amplifier comprising at least three MMIC amplifiers fabricated on an indium phosphate substrate and a band pass filter;

D) a beamformer for separating said amplified collected radiation to produce frequency dependent signals corresponding to said frequency dependent beams, said beamformer comprising:

1) a plurality of delay lines,

2) a millimeter wave lens, and

3) a plurality of millimeter wave power detectors; and

E) a sampling circuit for reading out frequency dependent signals to produce a one-dimensional image of the antenna field of view,

F) focusing means for focusing the sensor,

32. The screener as in Claim 31 wherein said focusing means comprises a cylindrical reflector and a cylindrical lens.

33. The screener as in Claim 31 wherein said amplifier comprises a co-planar waveguide design.

34. The screener as in Claim 31 wherein said amplifier provides gains of at least 50 dB.

35. The screener as in Claim 31 wherein each of said delay lines are comprised of etched copper to create circuit patterns of varying lengths.

36. The screener as in Claim 35 wherein said delay lines define copper surfaces having surface roughness less than 300 nanometers.

37. The screener as in Claim 31 wherein said plurality of sensors is arranged in four stacks each stack comprising at least 16 sensors.